Facilitators and Barriers to Developing Firefighter Resilience

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**Abstract**

*Purpose:* Developing resilience is vital for firefighters and other practitioners exposed to trauma as part of their day-to-day work in maintaining physical and mental resilience. However, further understanding of what factors facilitate and hinder the development of firefighter resilience and why is needed. The current study evaluates efficacy of support mechanisms currently in place, and develops an evidence base for interventions to support development of firefighter resilience.

*Design/Methodology/Approach:* Semi-structured interviews were conducted with 12 firefighters from across two regions in the UK, the Northwest and Southeast of England. Thematic analysis was used to analyse transcripts, highlighting themes within, and across, services to identify what factors affect development of firefighter resilience and why.

*Findings:* Thematic analysis highlighted four key themes shared by firefighters across regions: ‘informal support’, ‘formal support’, ‘basic welfare measures’, and ‘trust’. Importantly, how effective formal measures are perceived to be and the willingness for firefighters to access these resources was dependent upon the level of trust held in senior management. Firefighters across locations highlighted levels of trust were affected by industrial actions, which created divides. Accordingly, one way firefighter resilience may be further promoted is by altering how formal support mechanisms are accessed.

*Originality/Value:* Although existing research has found factors, which promote resilience of firefighters, evaluation of specific services is lacking. The current research highlights areas between two UK services where resilience is effectively being promoted, and areas for potential improvement.

Exposure to trauma poses financial and psychological implications for emergency responders. For firefighters, who are often exposed to trauma (Marmar *et al*., 2006; Hill and Brunsden, 2009), subsequent psychological distress is common (Deppa, 2015), as is increased sickness-absence (Morren *et al*., 2007; Penfold *et al*., 2008). Between 2015-2016, West-Midlands Fire Service figures show operational firefighters took an annual average of six sick days (Litchfield and Hinckley, 2016). London Fire Brigade (LFB) reported 3,461 stress and anxiety-related sick days taken in 2014-15 (LFB, 2016), with 1,262 taken between 2013-16 in Tower Hamlets (LFB, 2016).

One factor which protects against negative impacts of exposure to trauma is resilience (Pietrantoni and Prati, 2008); a process drawing upon positive emotions and experiences to remain stable through ‘healthy adjustment’ after potentially traumatic events (Bonnano *et al*., 2012). Resilience in the context of emergency response is further defined as a quality, which changes in response to experiences and environments to which a person is exposed (Fletcher and Sarkar, 2017). Although UK legislation and guidelines are in place to inform resilience support for firefighters (Fire and Rescue Authorities, 2013), further research should identify what factors facilitate and hinder development of this resilience and evaluate current support mechanisms.

*Developing resilience*

Firefighters view exposure to traumatic incidents as common (Murphy e*t al.*, 2004). They may be exposed to mass casualty incidents or firefighter death (SOP Center, 2010), leading to strong emotional reactions (Paton *et al.*, 2000). Whilst emergency responders often demonstrate the ability to deal with said challenges (Shakespeare-Finch, 2011; de la Vega *et al*., 2013), continued exposure risks effective functioning (Rutkow *et al*., 2011) and development of mental health problems (Pietrantoni and Prati, 2008; Lee *et al.*, 2014; Bobko and Kamin, 2015), including Post-Traumatic Stress Disorder (PTSD; Marmar *et al*., 1999; Laposa *et al*., 2003). Indeed, sickness-absence records show mental illness to be a common cause of firefighter absence (Governance, Audit and Scrutiny Committee, 2013).

As resilience in the form of positive adaptation following exposure to adversity (Fletcher and Sarkar, 2013) can reduce the impact of exposure to trauma on mental health (Marmar *et al*., 1999; Laposa *et al*., 2003), resilience is now considered vital for policy and programmes (Aldunce *et al*., 2014). However, this has taken place with little regard for theory or the wider evidence base (Aldunce *et al*., 2014). Understanding ‘what works’ in measures promoting development and maintenance of firefighter resilience and why is therefore of importance to policy efficacy.

One formal measure associated with promoting resilience in emergency responders is training. Evidence demonstrates the value of specialized trauma training for improving welfare management and resilience in US police officers (Sheehan *et al*., 2004). Data collated from several agencies identifies educational seminars and programmes focusing on critical incident stress management techniques as beneficial for pre-empting maladaptive reactions (Sheehan *et al*., 2004). Further, awareness-raising of stress management techniques for responding to critical incidents or disasters helps enable responders to develop a sense of meaning relating to response roles and responsibilities prior to incidents (Paton *et al.*, 2000).

Official post-incident debriefs where emergency responders discuss what happened, highlighting areas of best practice, can also promote firefighter resilience (Sattler *et al*., 2014). While exact underlying mechanisms promoting resilience are unknown, post-incident debriefing is a widely used tool despite controversy surrounding the efficacy of the approach in increasing resilience (Deahl, 2000; Regehr, 2001). Debriefing of this nature aims to proactively prevent development of PTSD, however the controversy with this lies in research showing not only do individuals recover naturally from traumatic events, but debriefing can pose a hindrance to this process (Richard, Richard and Anke, 2003; Hawker, Durkin and Hawker, 2011).

Sattler *et al*. (2014), however, suggest debriefing can be effective when it takes an emotion-focussed approach that supports the creation of meaning and shared sense-making rather than just focusing on problems. Transformational leadership styles are beneficial for assisting in this process of developing shared meaning (Harland *et al*., 2005; Hugelius *et al*., 2014) thus promoting resilience, where leaders demonstrate flexibility in their approach to helping responders make sense of their experiences (Bartone, 2006; Hugelius *et al*., 2014). This approach allows for viewing crises as learning opportunities (Harland *et al*., 2005) and leaders who demonstrate adaptive resilience strategies can serve as effective role models (Paton *et al*., 2000).

Firefighters also consider informal measures such as developing close relationships with colleagues for helping to cope following traumatic experiences as important (Hill and Brunsden, 2009). Those performing disaster-response roles form a ‘distinctive culture’ that fosters close relationships, where informal peer support is markedly valued for promoting resilience (Laposa *et al*., 2003; Sheehan *et al.*, 2004; Pietrantoni and Prati, 2008). Evidence shows firefighters are particularly reliant on close relationships to cope in the short-term following incidents, with the Watch talking together to transition back to ‘normality’ (Hill and Brunsden, 2009). Pietrantoni and Prati (2008) also suggest underlying mechanisms of having a sense of workplace community supports establishment of collective resilience. For example, recent resilience research has considered the role of humour for staff teams exposed to heightened work-related stress such as mental health workers (Lamb and Cogan, 2016) and firefighters (Blaney and Brunsden, 2015). Cook and Mitchell (2013) further found firefighters placed emphasis on informal support, which involved use of black humour among watch colleagues, as a primary support mechanism.

Although these formal and informal factors appear to influence resilience, less focus has been directed towards evaluating effectiveness of measures in place or identifying potential barriers (Deppa, 2015). As lack of availability, or poor implementation of, resources leaves firefighters vulnerable to stress (Sattler *et al*., 2014), focus should be directed towards evaluating mechanisms underpinning development and implementation of programmes promoting resilience (Murphy *et al*., 2004; Alexander and Klein, 2009).

In the UK, national legislation informs formal support that should be made available (Civil Contingencies Secretariat, 2013; Fire and Rescue Authorities, 2013). As legislation is open to interpretation by individual services, comparisons across regions are beneficial for identifying common problems, and successes, which could be implemented nationally. The current research therefore draws on perspectives of firefighters from two different regions to evaluate current mechanisms, potential barriers and examples of best practice for developing their resilience.

**Method**

*Participants*

12 fully trained employed operational firefighters (two female) from across two UK regions participated, four from a service in the Southeast (SE) and eight from the Northwest (NW) of England, with average number of years in service being 15.25 in the SE (SD = *6.60*) and 21.75 in the NW (SD = *6.48*). Although samples do not require replication of a general population to provide valid findings for interview-based qualitative research (King and Horrocks, 2010; Ranney *et al*., 2015), the sample captures a range of experience from varying ranks. For example, three SE firefighters were Watch Managers and the fourth was a Group Manager. For the NW, there was one firefighter, one Crew Manager, four Watch Managers, one Station Manager and one Group Manager.

*Procedure*

A qualitative approach was adopted using a process evaluation framework, commonly used to assess programmes to highlight best practice and areas of improvement (Weiss, 1998), focussing on what makes programmes work effectively, to assess anticipated outcomes (Linnan and Steckler, 2002; Murdoch, 2016). This was important for identifying what resilience support mechanisms firefighters across regions were aware of being locally available, and whether mechanisms met their needs.

Open-ended interviews are used within process evaluations to capture detailed perspectives of what works and why (Linnan and Steckler, 2002), specifically in relation to emergency response research to make comparisons among individual accounts (Patton, 2015; Ranney *et al*., 2015). While the subject of resilience is hardly novel, evaluation of both formal and informal resilience support mechanisms in the services included in this study had not previously taken place. Semi-structured interviews were therefore used, consisting of a pre-determined list of questions with flexibility to discuss issues emerging throughout interviews (King and Horrocks, 2010), to divert from the interview schedule in relation to interviewee responses (Edwards and Holland, 2013) and allow for reliable and comparable data across participants (Edwards and Holland, 2013; Patton, 2015) in addition to exploring a novel topic (Cohen, 2008).

The interview schedule was developed to allow participants to consider their own perceptions of resilience and how effective current measures were for managing this. For example, firefighters were initially asked: ‘Could you first describe to me what the word ‘resilience’ means to you?’. Drawing on fire and rescue service health, safety and welfare guidelines (FRA, 2013), questions regarding welfare management on the incident ground were included: ‘What were the important welfare and safety issues that you personally considered and tried to maintain for yourself within this incident?’. Firefighters were also asked to indicate their awareness of available measures and how useful they feel such measures.

The mean length of interviews as measured with total number of words is 8625.83 (SD = *1550.45*), and in length in minutes is 44.76 (SD = *9.00*). The mean percentage of words from all interviews relating specifically to resilience is 12.41%.

*Data Analysis*

Interviews were transcribed and analysed using thematic analysis to identify consistencies and patterns from within interviews to provide a rich and detailed account of perceptions of target populations (Braun and Clarke, 2006; Vaismoradi *et al*., 2013). Use of thematic analysis does not require pre-subscription to theoretical knowledge of the research topic (Braun and Clarke, 2006) making it a suitable method for exploratory research. Transcripts were read several times to gauge initial ideas of main topics and themes. Codes from within interviews were identified, and compared across interviews to develop significant sub-themes and subsequent global themes. Themes were determined by level of frequency across interviews and considering their significance from individual interviews (Floersch *et al*., 2010). A sub-sample of 30% of the data was coded by a second rater and Cohen’s Kappa indicates a moderate-good agreement, *K*=0.59.

**Results**

Thematic analysis of interview transcripts revealed four main themes of relevance to the research question: Basic Welfare (36.51% of resilience comments related to this theme); Formal Support (27.13%); Trust (23.11%) and Informal Support (13.25%). In total, 59.92% of comments came from NW firefighters compared to 39.99% from SE.

As Table 1 demonstrates, Basic Welfare and Formal Support were the two most prevalent themes for both NW and SE firefighters, followed by Trust and Informal Support. Although fewer firefighters were interviewed from SE, the prevalence of comments relating to Informal Support was greater than for NW.

Table 1. Percentage of quotes relating to each theme across regions

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Location | Basic welfare | Formal support | Trust | Informal support | Total |
| NW | 25.16% | 18.61% | 11.42% | 3.75% | 59.92% |
| SE | 11.35% | 8.53% | 11.68% | 9.50% | 39.99% |
| Total | 36.51% | 27.13% | 23.11% | 13.25% | 100% |

*Informal support*

Across both SE and NW, firefighters referenced use of ‘dark/black humour’, ‘banter’ and ‘talking around the mess table’ with members of their Watch to cope with stress. Firefighters considered informal support as effective for managing resilience because they could draw on shared experiences, especially after responding to particularly traumatic incidents. Use of dark humour and informal ‘chats around the mess table’ helped facilitate closer relationships, which was considered important for allowing firefighters to feel comfortable talking about sensitive issues.

*‘…if you’ve got a close bunch of friends they know how you work, they know how you tick, they know when something’s wrong, they often know how to deal with it … so that’s why the informal side works for me’*

*‘…we engage with our colleagues on the watch and we you know we’re supposed to get to that family stage…there’s quite a lot of informal, informal support going on … somebody’s having um an issue their first port of call will be talking to their watch’*

*‘… We’ve got a dark heart, or a dark sense of humour’*

*‘You usually just do it over a bit of black humour and a cup of tea to be honest’.*

*‘You’ve probably heard the term “around the mess table” so after an incident you go back, everyone talks a bit, and some of its black humour to some extent’*

*‘Most of the issues you have around stations talked around the mess table … it’d be called banter’*

*‘…Sometimes just that informal chat helps,’*

Firefighters felt developing close relationships was important for recognising common patterns of behaviours in one another and, therefore, to identify when colleagues were experiencing problems.

*Formal Support*

Firefighters highlighted two main location-specific formal measures of support, with NW firefighters referencing ‘Defusion’ and SE firefighters referencing the Advisory and Counselling Service (ACS).

In NW, following potentially traumatic critical incidents where either a death or serious injury occurs, a trained Station Manager facilitates Defusion. This is a form of debriefing taking place as soon after an incident as possible, identifying issues and reactions of emotional distress among those involved. Formal debriefing processes such as this are used to identify problems (Civil Contingencies Secretariat, 2013) and capture reactions from an entire Watch if the incident resulted in particularly negative consequences, including loss of a firefighter (Sattler *et al*., 2014). Either firefighters being debriefed or Station Managers facilitating discussions are able to identify issues. The Station Manager can then make referrals to Occupational Health (OH) or conduct further official debriefs. Some NW firefighters commented that the automatic introduction of Defusion measures following a death or serious injury represented a positive step forward, in acknowledging potential impacts of incidents on firefighter resilience.

*‘… I suppose it would depend on what actually, if, if somebody died in the, the incident … Then this defusing officer comes down and erm will talk to you and you are sort of replaced ‘cause you’re waiting for them to turn up … ‘cause certain incidents you could still be working on and you still have a difficult um situation to deal with’*

*‘The defusion for me, is a winner all day long’*

*‘There’ll be a defusing officer will come out and he’s generally a station manager … the intention is definitely positive’*

*‘I’m not really sure that the training is suitable because – and a lot of the time you get a senior officer down, not everyone wants to talk to a senior officer after an incident, people just want to relax … but I know that it is in faith, and it’s a lot better than it was’*

In contrast, SE firefighters referenced ACS as their main formal measure. Following critical incident involvement, the Officer in Charge (OIC) of the responding Watch receives a phone-call from ACS, and face-to-face counselling programmes are offered for individual members of that Watch. General access to ACS is available to firefighters, who can self-refer for support. Advice on how to access ACS is often gained through senior officers or Human Resources (HR). Effectiveness of ACS was partly dependent upon individual differences amongst firefighters such as personality, ‘macho’ attitudes or struggling to accept help. The impact of individual differences on the outcome of reactions to traumatic incidents has been well documented (Sattler *et al*., 2014; Duan *et al*., 2015).

*‘…We have regular twice a year, once a year, health checks with advice and counselling services … I think they’re called counselling and wellbeing now’*

*‘Also after we attend a difficult incident, if somebody passes away … you get a phone call from the advisory and counselling service’*

*‘…I think you got to be aware that people are different so I know there’s one person who doesn’t go to counselling and welfare’*

*‘I think it’s, different things will work for different people … everyone’s different … some people it will be due to their personality traits or types … the best thing you can do is just find the, the pathway that works for you’*

*‘It’s still a bit of a macho thing of “oh, I’m not bothered, I’m not worried’’’*

*‘…in an organisation that is still, is still very, very macho if you like we’ve got, we’ve got this you know ‘’I’m indestructible’ … that can become a sort of barrier then’*

*‘…we see ourselves as copers and people who help other people cope so for us to admit that we actually need help is quite a difficult step to take … I think generally what people do is they will wait until it gets really bad .. If you’re the people normally out there saving people to put your hand up and say you might been a bit of saving yourself it’s just really hard’*

Although formal mechanisms in place differed across regions, firefighters were united in their perception that willingness to access the facilities available was affected by trust towards the organization. Mistrust towards senior management was perceived as a substantial barrier to accessing resources available.

*Trust*

Both NW and SE firefighters emphasised the importance of having trust in systems and people to support them in promoting resilience. Comments from across regions emphasised distrust towards senior management and HR had arisen following industrial strike action. Whether or not firefighters had taken part in this action caused divisions.

*‘…There is an elephant in the room all the time in this service unfortunately. We had er a couple of um strikes and … some people chose to work the strike and some people chose not to work the strike and, and that divide is still there unfortunately’*

*‘… there’s not only the, the resilience you need when you’re um in difficult situations, but there is also conflict within um within the organisation itself’*

*‘Things in the past with the, shall we say, industrial relations has been, there’s been strikes and some people worked, some people didn’t. There’s still a lot of animosity between those that went on strike and those that didn’t’*

*‘There’s a lot of mistrust and it’s developed from things going on with um going on strikes and things like that … you’ve got that real mix there that is very damaging to an operational staff and there is no trust … I do believe that, the senior management are trying to close the gap but there is a hell of a lot of mistrust and it will take a very long time’*

*‘Erm, there’s been a lot of er, industrial trouble in the service in the last few years … there’s a trust element you have to make sure that the individual that requires a little bit of assistance er can be identified by people that they trust … I’ve been fortunate enough to work with fire fighters who’ve needed some form of rehabilitation … after they’ve had a mental health issue … and I think it worked well because they were able to trust me’*

This links significantly with ‘formal support’ due to senior staff being gatekeepers for accessing support services. For example, NW firefighters specifically referenced having a Station Manager who had not been involved in industrial action Defusing a team that had been involved, or vice versa. This was considered an issue limiting effectiveness of Defusion because Watch members felt uncomfortable being honest and open. Similarly, SE firefighters highlighted because senior managers or HR often provided advice regarding ACS access, mistrust could result in reluctance to request advice.

*‘So after an incident, they have an officer come out and he’ll like – he’s called a defusing officer ... So if you’ve got a station full of um FBU members and then you get a person whose actually you know worked through industrial action come to defuse them, it’s gonna be interesting … So, it can – actually, can have a negative effect’*

*‘…we’ve got a HR department that we can contact but in the past because of industrial action … there is a big mistrust between the operational staff and HR … the industrial action about 5 years ago was handled so badly on both sides, um, and it’s sort of left a bit of a vacuum in, with peoples’ trust’*

Firefighters from across NW and SE emphasised the importance of anonymity in accessing support, in the interest of maintaining trust in accessing formal measures anonymously. Failure to guarantee anonymity created a barrier to seeking further advice or welfare assistance.

*‘Certainly more confidential that way isn’t it? … Receiving that sort of counselling or whatever, if its someone you don’t know and someone you know isn’t very connected to the operational side, may work.’*

*‘There’s been a massive improvement … they understand the process, they understand er the trust involved … whatever stays in the room kind of stays in the room’*

*‘… I think we do need this anonymous approach … maybe an anonymous or an email service or phone in … definitely anonymous emails … so maybe not even using your brigade email, just using a personal email’*

Anonymity of requests for help from formal measures of support, and holding trust in senior officers delivering debriefs, were therefore important to firefighters.

*Basic Welfare*

‘Basic welfare’ refers to measures in place at incident sites and was consistently raised by SE and NW firefighters. Measures for maintaining welfare on incident grounds consists of access to sustenance, rest and hygiene through provision of food, water, regular crew rotation and access to toilet facilities. Access to these measures was considered to increase resilience because remaining fed, hydrated and rested increased the ability of firefighters to continue working, specifically when experiencing fatigue on protracted incidents such as large factory fires or extensive flooding (FRA, 2013). For both NW and SE-based firefighters, the Salvation Army was noted as being a key agency that provided these resources during such incidents.

*‘…you’ve got the Salvation Army who are um a voluntary service so they will come out to incidents of at a request of 8 pumps and above … they will provide sandwiches, drinks, chocolates … it does amaze me that these people just get up and do this thing’*

*‘… d’you know what I mean by a wagon? If a wagon turns up? … With hot dogs or whatever with food … yes, the Salvation Army turn up … we have erm the cool van … which has got water on, and packets of food which is quite good’*

*‘Somebody out there cares, you know … And its 4 o’clock in the morning and you’re soaked wet through and it’s the middle of winter but somebody turns up and goes ‘’here’s a hot cup of tea and a sandwich’’ and that’s just like heaven!’*

*‘…the Salvation Army usually comes out on more protracted incidents and um they provide food, hot drinks’*

Both locations highlighted the importance of effective leadership for maintaining resilience amongst firefighters managing an incident, defined as having an effective OIC who planned ahead by requesting measures such as the Salvation Army. When OIC’s effectively plan their management of protracted incidents, personnel felt their resilience was promoted. Issues with failure to request toilet facilities were consistently noted as being problematic, particularly for female firefighters.

*‘As a watch manager, one of my first considerations is: how long am I gonna be here, and what do I need to keep my troops happy?’*

*‘… A good OIC will pre-plan that I think – ‘this is gonna be protracted, I’m gonna get it now’’*

*‘…it’s not just knowing when you’ve need to be relieved, it’s knowing ahead of that point’*

*‘…that is part of an incident commander’s decision making … you do have to plan in advance and in theory you’re meant to plan that 90 minutes in advance of when you need it … if a relief is ordered too late or too last minutes it is definitely picked up … discussions are had as to why it’s been too late’*

*‘So in a large incident you have to consider things like, if we’re gonna be there for a while, are there any toilets? Where are we gonna get these from?’*

*‘… For years I’ve been putting stuff down about toilet facilities at incidents … we’re terrible at it, that side of welfare … And there’s no toilet facilities … I think that needs to be looked at for female fire fighters – but I say female, any fire fighter you know fellas shouldn’t have to go behind the tree because there’s a tree, d’you get what I mean?’*

However, there was a difference between SE and NW in terms of crew rotation procedures. NW firefighters consistently highlighted negative impacts of fatigue on their resilience from ‘longer rotations’, where depleting workforce numbers means they must sustain pre-arranged shift patterns following response to protracted incidents. Conversely, SE firefighters felt they access effective shift rotation policy, maintaining their resilience by preventing fatigue experienced during incidents.

*‘…there’s a welfare system in theory in place which is … the relief system … so that is a very robust strict procedure…Nobody should be overworked on an incident ground … I do think the relief structure we have is very good’*

*‘By the constraints that are placed upon us for staffing, our organisation mean that we do have to keep people at incidents longer … we’ve always had welfare provision so I think it will evolve, so I would say at the moment it’s adequate … but it’s only adequate’*

*‘Especially in light of resources diminishing, you know, you never used to have – you used to have loads of staff to – and you used to just go in and go in and you could rotate them. Now we haven’t got than many appliances about, so you could be at an incident yourself for like 10 minutes which is a long time’*

*‘Ask for more appliances if they’re available … But we don’t, we don’t ask for appliances for welfare … and maybe that’s something we should look at but I don’t think it’ll ever happen because we’re getting smaller’*

*‘… and unfortunately ‘cause the service has got smaller, sometimes they might have to stay a little bit longer than they used to do’*

In summary, basic needs being met during incidents was important to participants for maintaining their resilience, as were leadership and planning skills of OICs.

**Discussion**

The current study aimed to identify what factors facilitate and hinder firefighter resilience, and evaluate current measures. Thematic analysis of interviews with firefighters from across two UK regions highlighted four key themes affecting development and maintenance of resilience: ‘informal support’, ‘formal support’, ‘trust’ and ‘basic welfare’. In particular, findings suggest trust is central to effectiveness of informal and formal resilience support measures, with basic welfare provision affecting trust and resilience.

Both SE and NW firefighters considered reluctance to access formal measures of support predominantly due to mistrust held in senior management and HR, who serve as gatekeepers. Across both worksites included, mistrust stemmed from industrial strike action, where some firefighters engaged in strikes and others did not. While existing research identifies early interventions such as debriefs are potentially positive methods for managing reactions to critical incidents (Sheehan *et al*., 2004) when taking an emotional-focused approach, seeking meaning in experiences (Sattler *et al*., 2014), the current finding highlights an important factor influencing debrief effectiveness is in fact whether firefighters trust the facilitating officers. Previous research also demonstrates importance of trust in leadership for promoting resilience (Bonnano, 2005), suggesting promotion of trust in senior managers is effective for promoting resilience by ensuring firefighters can access advice regarding services anonymously. While the theme is raised across both services included, and may well extend to UK fire and rescue services nationally, internationally this may be of lesser relevance.

In addition to formal measures, firefighters highlight importance of access to ‘basic welfare’ such as sustenance and hygiene facilities as important for maintaining resilience. Adequate welfare provisions at incidents are considered important for upholding welfare and safety systems on the incident ground (FRA, 2013). Comments highlighted that when these facilities were not adequately arranged by the OIC, this negatively impacted resilience. This is in line with previous literature highlighting the importance of leaders being able to adapt situations (Harland *et al*., 2005; Bartone, 2006). In particular, current findings demonstrate abilities of OIC’s to plan ahead effectively during protracted incidents as vital for maintaining resilience. Firefighters felt these mechanisms were mostly in place, but given the impact that delays to making these resources available can have to staff wellbeing, training provided to all firefighters adopting an OIC-role should focus on this issue.

Peer support was considered important to firefighters in promoting their resilience in day-to-day duties, and following exposure to traumatic incidents. In line with previous research, this emphasizes the importance of close working relationships as a method of developing and maintaining resilience to protect fire-fighters against adverse reactions (Murphy *et al*., 2004; Sheehan *et al*., 2004; Hill and Brunsden, 2009) in addition to emphasis placed on use of humour (Cook and Mitchell, 2013; Blaney and Brunsden, 2015; Lamb and Cogan, 2016). Given the vital role informal networks play in supporting firefighter wellbeing, and with early intervention being key in responding to welfare needs of personnel post-critical incidents (Laposa *et al*., 2003; Sheehan *et al*, 2004; Hill and Brunsden 2009), it may be beneficial for UK Fire and Rescue Services to consider training personnel within the Watch to be vigilant of maladaptive coping mechanisms among peers. This echoes previous calls to focus on informal strategies to manage firefighter resilience (Sheehan *et al*., 2004; Pietrantoni and Prati, 2008), offering alternative support less affected by mistrust in management. Further research should identify what form such training programmes should take to develop skills in identifying maladaptive coping mechanisms among colleagues. Given the importance of humour, and more specifically ‘black humour’, being placed by firefighters on developing their resilience, in line with more recent research (Blaney and Brunsden, 2015; Lamb and Cogan, 2016) this could be a future research area.

It is also recommended that resilience training be implemented to pre-empt potentially negative reactions of exposure to traumatic events, which may increase resilient responses following potentially traumatic circumstances (Pietrantoni and Prati, 2008; de la Vega *et al*., 2013). This echoes Sheehan *et al.*’s (2004) recommendation for specialised pre-crisis education focussing on critical incident stress management. This could effectively promote self-efficacy through social support and positive thinking habits (Deppa, 2015), placing emphasis on utilising peer support and combating limitations of formal measures.

Further, as effective leadership in the form of adapting to situations is consistently shown as positive for developing resilience (Harland *et al*., 2005; Bartone, 2006), focussing on this aspect of training for those in management/leadership positions is advisable. Utilising a ‘transformational’ leadership style is also recommended (Harland *et al*., 2005; Bartone, 2006), where leaders act as resilient role models (Paton *et al*., 2000) by using potentially traumatic incidents as learning experiences (Harland *et al*., 2005). As existing literature is lacking in explaining mechanisms behind why this leadership style promotes resilience of subordinates, further research would be beneficial.

Overall, findings highlight the importance of formal and informal measures for developing and maintaining firefighter resilience. In particular, firefighters consider the importance of basic welfare measures on the incident ground and use of informal measures of peer support as important for maintaining resilience. Current utility of formal support measures is limited where there is mistrust in management systems, which increases reluctance to access formal services. Providing resilience training may be beneficial. However, future research is needed to determine what form peer resilience training should take, to be effective for firefighters. Future research should focus on conducting more in-depth targeted interviews to evaluate specific measures in place, such as Defusion, including what factors make firefighters more receptive to accessing resources. A limitation of the current study is the participant group being specifically fully trained employed firefighters. Should future research directions recommended by this article be pursued, samples could be widened to represent part-time or ‘on call’, Retained firefighters. Similarly, whilst the current study demonstrates the value of comparing and contrasting mechanisms in place across two regions, more systematic and widespread evaluation across all regions of the UK could be beneficial.

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